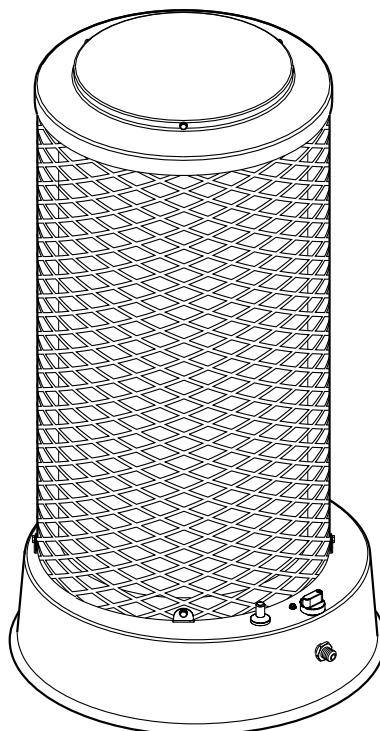


# **PROPANE AND NATURAL GAS CONSTRUCTION HEATERS OWNER'S MANUAL**



## **Models: TC100VR and TC100VRNG**

**IMPORTANT:** Read and understand this manual before assembling, starting, or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.



### **GENERAL HAZARD WARNING:**

**FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING AND/OR ELECTRICAL SHOCK.**

**ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.**

**IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT THE MANUFACTURER.**

# TC100VR (Propane) and TC100VRNG (Natural Gas) 100,000 BTU CONSTRUCTION HEATERS

## SAFETY INFORMATION

### WARNINGS

**⚠ WARNING: FIRE, BURN, INHALATION, AND EXPLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.**

**⚠ WARNING: NOT FOR HOME OR RECREATIONAL VEHICLE USE.**

The heater is designed for use as a construction heater in accordance with ANSI Z83.7/CGA 2.14. Other standards govern the use of fuel gases and heating products for specific uses. Your local authority can advise you about these. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration or repair. Properly used, the heater provides safe economical heating. Products of combustion are vented into the area being heated.

We cannot foresee every use which may be made of our heaters. **CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT HEATER USE.**

Other standards govern the use of fuel gases and heat producing products for specific uses. Your local authorities can advise you about these.

**Carbon Monoxide Poisoning:** Some people are more affected by carbon monoxide than others. Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Check for proper ventilation and have heater serviced.

**Propane Gas:** Propane gas is odorless. An odor-making agent is added to propane gas. The odor helps you detect a propane gas leak. However, the odor added to propane gas may fade. Propane gas may be present even though no odor exists.

**Natural Gas:** Natural gas has a distinctive odor. This odor helps you detect a natural gas leak. However, the odor may fade. Natural gas may be present even though no odor exists.

Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

- Install and use heater with care. Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the *Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/NFPA 58* and the *Natural Gas Installation Code, CAN/CGA B149.2*. This instructs on the safe storage and handling of propane gases.
- For Model TC100VR, use only propane gas set up for vapor withdrawal.
- For Model TC100VRNG, use only natural gas. Do not attempt to use with LP gas.
- Provide adequate ventilation. Before using heater, provide at least a 3 square foot opening of fresh, outside air.
- This heater produces carbon monoxide, which is listed by the State of California as a reproductive toxin under Proposition 65.
- For indoor use only. Do not use heater outdoors.
- Keep heater away from strong drafts, wind, water spray, rain, or dripping water.
- Do not use heater in occupied dwellings or in living or sleeping quarters.
- Do not use heater in a basement or below ground level. If a leak occurs, gas may collect into hazardous amounts.
- Keep appliance area clear and free from combustible materials, gasoline, paint thinner, and other flammable vapors and liquids. Dust is combustible. Do not use heater in areas with high dust content.
- Minimum heater clearances from combustibles: Sides: 6 feet, Top: 5 feet.

- For Model TC100VR, keep heater at least six feet from propane tank(s).
- For Model TC100VR, keep propane tank(s) below 100° F.
- Use only the hose and factory preset regulator provided with the heater (if used).
- Check heater for damage before each use. Do not use a damaged heater.
- Check hose (if used) before each use of heater. If highly worn or cut, replace with hose specified by manufacturer before using heater.
- Do not alter heater. Keep heater in its original state.
- Do not use heater if altered.
- Locate heater on stable and level surface if heater is hot or operating.
- Not intended for use on finished floors.
- Never block air inlet (bottom of shell) or air outlet (around top of shell) of heater.
- Do not leave heater unattended.
- Keep children and animals away from heater.
- Never move, handle, or service a hot or operating heater. Severe burns may result. You must wait 20 minutes after turning heater off.
- To prevent injury, wear gloves when handling heater.
- Never attach duct work to heater.
- Turn off gas supply to heater when not in use.
- Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries.

## UNPACKING

1. Remove all packing items applied to heater for shipment. Keep plastic cover caps (attached to valve inlet and hose/regulator assembly) for storage.
2. Remove all items from carton.
3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

# OWNER'S MANUAL

## PRODUCT IDENTIFICATION

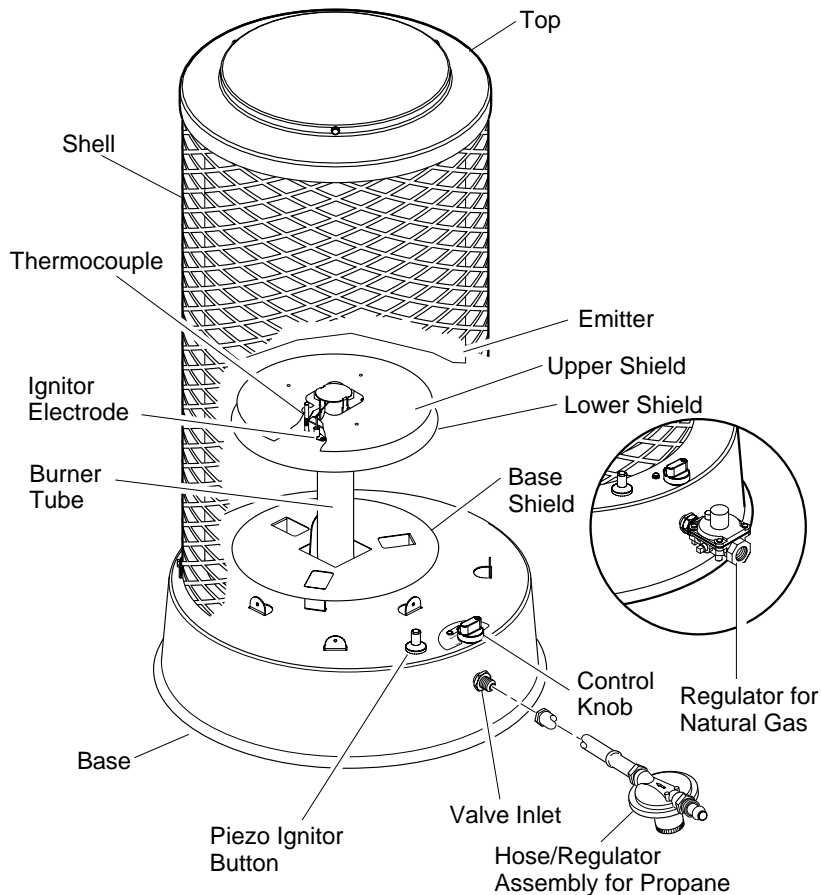


Figure 1 - Product Identification

## THEORY OF OPERATION

**The Fuel System for Propane:** The hose/regulator assembly attaches to the propane gas supply. This provides fuel to the heater.

**The Fuel System for Natural Gas:** The gas supply attaches to the heater by a minimum 3/4 inch i.d. hose or flexible connector. User must supply hose or flexible connector. The length should be no more than 10 feet long. The natural gas moves through the regulator and out the nozzle.

**The Ignition System:** The piezo ignitor lights the pilot fuel supply.

**The Automatic Control System:** The automatic control valve shuts off the heater if the flame goes out.

## PROPANE SUPPLY (FOR MODEL TC100VR)

You must provide propane gas and propane tank(s).

Use this heater only with a propane vapor withdrawal supply system. See Chapter 5 of the *Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/NFPA 58 and/or CAN/CGA B149.2*. Your local library or fire department will have this booklet.

The amount of propane gas ready for use from propane tanks varies. Two factors decide this amount.

1. The amount of liquid propane gas in tank(s)
2. The temperature of tank(s)

The chart below shows the minimum number of 100-pound tanks needed to run the heater. Connect tanks together with a manifold. Do not operate this product with any tank smaller than 100 pounds.

Average Temp. (°F) At Tank location	Number of Tanks
60°	2
40°	2
32°	2
20°	2
10°	3
0°	3

Less gas is vaporized at lower temperatures. Two or more 100-pound tanks or one larger tank may be needed in colder weather. Your local propane gas dealer will help you select the proper supply system.

## NATURAL GAS SUPPLY (FOR MODEL TC100VRNA)

You must provide the natural gas supply and the connections to the heater.

The natural gas supply must have a capacity of 100 scfh at 6 inches water column to 14 inches water column.

Consult your natural gas supplier for proper sizing of the natural gas supply lines.

Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the *National Fuel Gas Code Handbook, NFPA54/ANS Z223.1* and the *Natural Gas Installation Code, CAN/CGA B149.2*.

# TC100VR (Propane) and TC100VRNG (Natural Gas) 100,000 BTU CONSTRUCTION HEATERS

## SPECIFICATIONS

### PROPANE MODEL TC100VR

	LOW	HI
Rating(Btu/Hr)	40,000	100,000
Fuel	Propane Vapor Only	
Fuel Consumption		
Gallons/Hour	.44	1.1
Pounds/Hour	1.86	4.6
Supply Pressure (To Regulator)		
Maximum	200 psi	
Minimum, for input adjustment	20 psi	
Manifold Pressure	25.6" w.c. 13.3" w.c.	
Ignitor Gap	.15"	
Weight (Pounds)	30	
Shipping Weight (Pounds)	35	
Size - H x Dia. (Inches)	34 x 18	

### NATURAL GAS MODEL TC100VRNG

	LOW	HI
Rating(Btu/Hr)	50,000	100,000
Fuel	Natural Gas Only	
Fuel Consumption		
Cubic Ft/Hr	48	100
Supply Pressure (To Regulator)		
Maximum	14 inches w.c.	
Minimum, for input adjustment	6 inches w.c.	
Manifold Pressure	3.2" w.c.	2.8" w.c.
Ignitor Gap	.15"	
Weight (Pounds)	30	
Shipping Weight (Pounds)	35	
Size - H x Dia. (Inches)	34 x 18	

## VENTILATION

**⚠ WARNING: Provide at least a 3 square foot opening of fresh, outside air while running heater. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.**

### FRESH OUTSIDE AIR OPENING REQUIREMENTS

HEATER SIZE	SQUARE FOOT OPENING
100,000 Btu/Hr	3.0

## INSTALLATION

### PROPANE MODEL TC100VR

**⚠ WARNING: Review and understand the warnings in the Safety Information section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.**

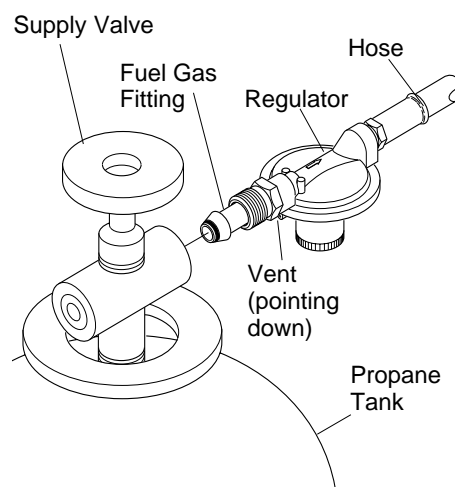
**⚠ WARNING: Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once.**

1. Provide propane supply system (see *Propane Supply*, page 3).
2. Connect fuel gas fitting on hose/regulator assembly to propane tank(s). Turn fuel gas fitting counterclockwise into threads on tank. Tighten firmly using a wrench. **IMPORTANT:** Tighten regulator with vent pointing down. Pointing vent down protects regulator from weather damage.
3. Connect hose to the valve inlet. Tighten firmly using a wrench. You must use the regulator supplied with heater even if propane tank has one.

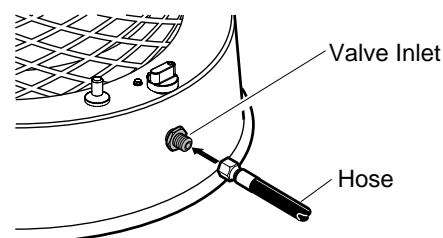
4. Open propane supply valve on propane tank(s) slowly. **Note:** If not opened slowly, excess-flow check valve on propane tank may stop gas flow. If this happens, you may hear a click inside the regulator assembly, this is the check valve closing. To reset the excess flow check valve, close propane supply valve and open again slowly.
5. Check all connections for leaks. Apply mixture of liquid soap and water to gas joints. Bubbles forming show a leak that must be corrected.

**⚠ WARNING: Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak that must be corrected. Correct all leaks at once.**

6. Close propane supply valve.



**Figure 2 - Regulator With Vent Pointing Down**



**Figure 3 - Hose and Valve Inlet**

# OWNER'S MANUAL

## INSTALLATION

### Continued

### NATURAL GAS MODEL TC100VRNG

**⚠ WARNING:** Review and understand the warnings in the *Safety Information* section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

**⚠ WARNING:** Test all gas piping and connections for leaks after installation or servicing. **Never use an open flame to check for a leak.** Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once.

1. Provide natural gas supply system.
2. Install plumbing to a low pressure natural gas source. The source must be regulated to 1/2 psi maximum 3/4 inch i.d. hose or flexible connector not over 10 feet long.
3. Connect the hose to the regulator inlet. Use thread sealing compound. Tighten with a wrench.
4. Open natural gas supply valve slowly.
5. Check all connections for leaks.

**⚠ WARNING:** Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak that must be corrected. Correct all leaks at once.

6. Close natural gas supply valve.

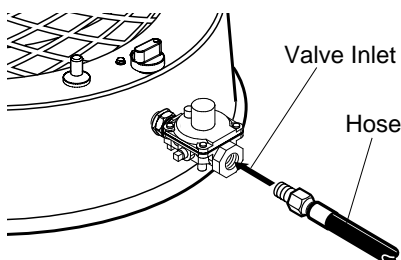


Figure 4 - Hose and Valve Inlet

## OPERATION

**⚠ WARNING:** Review and understand the warnings in the *Safety Information* section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

### TO START HEATER

1. Follow all installation, ventilation, and safety information.
2. Locate heater on stable and level surface. Make sure strong drafts do not blow on heater.
3. Make sure unit is turned off by slightly depressing and turning control knob fully clockwise to OFF.
4. Open supply valve on gas slowly. *Note:* If not opened slowly, excess-flow check valve on propane tank may stop gas flow. If this happens, you may hear a click inside the regulator assembly, this is the check valve closing. To reset the excess flow check valve, close propane supply valve and open again slowly.
5. Slightly depress and turn control knob counterclockwise to the LOW position (see Figure 5 or 6).
6. With the control knob pushed all the way in, press and release the piezo ignitor button. Keep pressing piezo ignitor button until the burner lights. Hold control knob down for a maximum of 15 seconds while attempting ignition. If heater does not ignite, release control knob and wait 3 minutes before attempting reignition.
7. After ignition, hold control knob down for about 30 seconds. This activates the automatic control system.
8. When burner remains lit, set heater at the desired heat level by slightly depressing the control knob and turning it counterclockwise to the MED or HIGH settings (see Figure 5 or 6). *Note:* The emitter glows red on the HIGH setting only.
9. If burner goes out, turn off gas. Slightly depress and turn control knob fully clockwise to OFF. Check fuel supply. If adequate fuel is available, wait 5 minutes, and restart heater beginning at step #1.

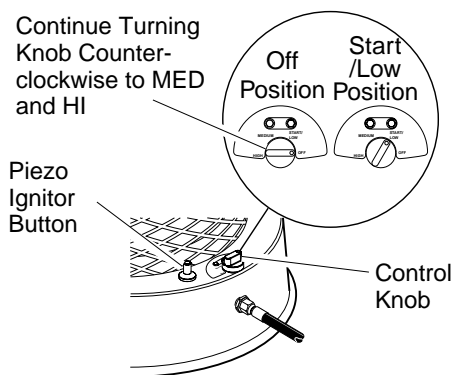


Figure 5 - Control Knob and Piezo Ignitor Button Locations for Propane Model TC100VR

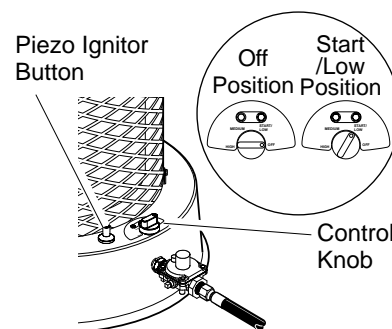


Figure 6 - Control Knob, and Piezo Ignitor Button Locations for Natural Gas Model TC100VRNG

### TO STOP HEATER

1. Tightly close gas supply valve. Allow heater to burn remaining fuel in hose.
2. Shut off burner. Do this by pushing in the control knob and turning clockwise to the OFF position.

### TO RESTART HEATER

1. Wait five minutes after stopping heater.
2. Restart heater by following steps under *To Start Heater*.

**⚠ CAUTION:** Running heater below specified input rating may cause flashback. During flashback, the burner flame is mostly yellow. The flame will burn inside the burner tube, causing a roaring noise. If flashback occurs, turn heater off. After burner tube cools, restart the heater.

# TC100VR (Propane) and TC100VRNG (Natural Gas) 100,000 BTU CONSTRUCTION HEATERS

## STORAGE

**⚠ CAUTION:** Disconnect heater from propane supply tank(s) for Model TC100VR.

1. For Model TC100VR, store propane tank(s) in safe manner. Refer to Chapter 5 of *Standard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58* and/or *CAN/CGA B149.2*. Follow all local codes. Always store propane tanks outdoors.
2. Place plastic cover caps over brass fittings on inlet connector and hose/regulator assembly.
3. Store in a dry, clean, and safe place.

## MAINTENANCE

**⚠ WARNING:** Never attempt to service heater while it is connected to gas supply, operating, or hot. Severe burns can occur.

1. Keep heater clean.
2. Inspect heater before each use. Check connections for leaks. Apply mixture of liquid soap and water to connections. Bubbles forming show a leak that must be corrected. Correct all leaks at once.
3. Inspect hose/regulator assembly, if used, before each use. If hose is highly worn or cut, replace.
4. Have heater inspected yearly by a qualified service person.

## ACCESSORIES

Purchase these heater accessories and parts from your nearest dealer or service center. If they can not supply an accessory or part, either contact your nearest Parts Central (listed in the separate Authorized Service Center booklet) or call DESA International's Parts Department at 1-800-972-7879. You can also write to the address listed on the back page of this manual.

Part Number	Description
LPA4020	Fuel Gas Connector for Propane Tanks
LPA3125	Hose and Regulator Assembly

## REPLACEMENT PARTS

**⚠ WARNING:** Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries. This will also protect your warranty coverage for parts replaced under warranty.

### PARTS UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), either contact your nearest Parts Central or call DESA International's Technical Service Department at 1-800-323-5190.

When calling DESA International, have ready

- your name
- your address
- model and serial numbers of your heater
- how heater was malfunctioning
- purchase date

In most cases, we will ask you to return the defective part to the factory.

### PARTS NOT UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), either contact your nearest Parts Central or call DESA International's Parts Department at 1-800-972-7879 for referral information.

When calling DESA International, have ready

- model number of your heater
- the replacement part number

# OWNER'S MANUAL

## TROUBLESHOOTING

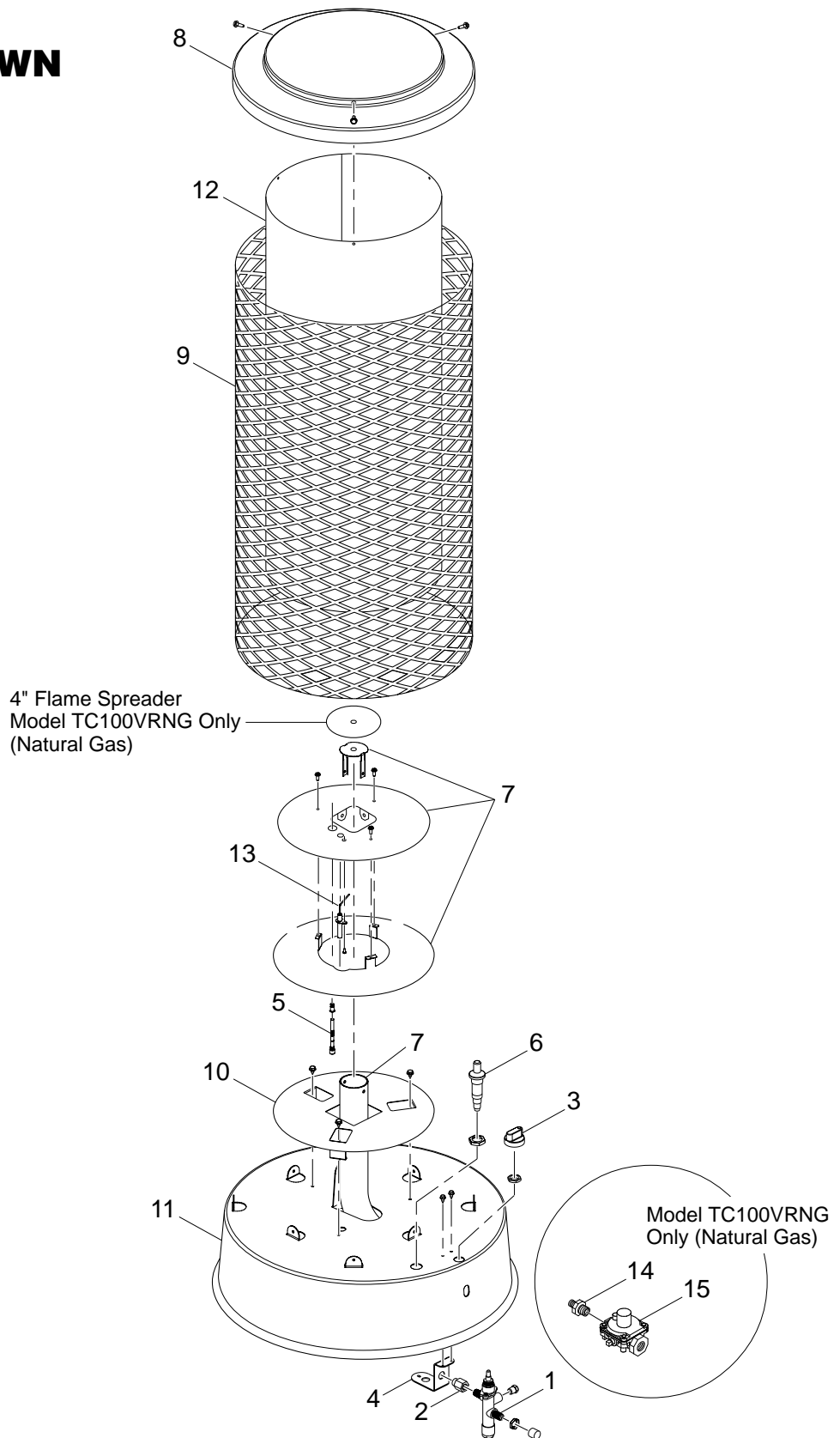
*Note:* For additional help, call DESA International's Technical Service Department at 1-800-323-5190 or visit our website at [www.desatech.com](http://www.desatech.com).

**⚠ WARNING:** Never attempt to service heater while it is connected to gas supply, operating, or hot. Severe burns can occur.

SYMPTOM	POSSIBLE CAUSE	REMEDY
Burner fails to light	<ol style="list-style-type: none"><li>1. (Propane model only) Propane supply valve closed on propane tank(s)</li><li>2. Excess flow check valve closed</li><li>3. Blockage in burner orifice</li><li>4. Piezo ignition system not sparking</li></ol>	<ol style="list-style-type: none"><li>1. (Propane model only) Open propane supply valve slowly</li><li>2. Close propane supply valve on propane tank and reopen slowly</li><li>3. Replace burner orifice</li><li>4. Check to assure ignitor electrode gap is .15" Check wire lead for damage. Replace piezo ignitor and/or ignitor electrode as necessary</li></ol>
Burner lights but goes out when automatic control valve button is released	<ol style="list-style-type: none"><li>1. Not enough warm up time</li><li>2. Low gas pressure</li><li>3. Thermocouple loose or needs to be replaced</li><li>4. Automatic control valve needs to be replaced</li></ol>	<ol style="list-style-type: none"><li>1. Relight, hold automatic control valve button in 45 seconds</li><li>2. (Propane model only) Check propane tank(s) for proper gas supply (Natural gas model only) Check natural gas supply</li><li>3. Tighten connection or replace thermocouple</li><li>4. Replace automatic control valve</li></ol>
Burn rate is low, emitter not glowing	<ol style="list-style-type: none"><li>1. Control valve is on LOW</li><li>2. Blockage in burner orifice</li><li>3. Low gas pressure</li><li>4. Low fuel supply</li></ol>	<ol style="list-style-type: none"><li>1. Push and turn valve counter clockwise to HIGH</li><li>2. Replace burner orifice</li><li>3. Check gas supply; check regulator output</li><li>4. Consult gas supplier</li></ol>
Flames are extremely high coming out of emitter	<ol style="list-style-type: none"><li>1. (Natural gas model only) Unit has been connected to propane gas instead of natural gas</li></ol>	<ol style="list-style-type: none"><li>1. (Natural gas model only) Check gas source and replace with natural gas</li></ol>

# TC100VR (Propane) and TC100VRNG (Natural Gas) 100,000 BTU CONSTRUCTION HEATERS

## ILLUSTRATED PARTS BREAKDOWN



# OWNER'S MANUAL

## PARTS LIST

This list contains replaceable parts used in your heater. When ordering parts, follow the instructions listed under *Replacement Parts* on page 6 of this manual.

KEY NO.	TC100VR PART NO.	TC100VRNG PART NO.	DESCRIPTION	QTY.
1	103930-02	103930-03	Valve Assembly	1
2	103032-02	103032-03	Nozzle	1
3	099393-03	099393-03	Control Knob	1
4	103037-02	103037-02	Nozzle Locator	1
5	107374-01	107374-01	Thermocouple Kit	1
6	102445-01	102445-01	Piezo Ignitor	1
7	106184-01	106184-02	Burner Kit	1
8	104145-02	104145-02	Top Disk	1
9	103898-03	103898-03	Shell	1
10	106165-01	106165-01	Base Shield	1
11	106168-01	106168-02	Base	1
12	106173-01	106173-01	Emitter	1
13	106174-01	106174-02	Ignitor Electrode	1
14	–	104115-01	1/2 NPT to 1/4 NPT Bushing	1
15	–	103406-02	Regulator	1
<b>PARTS AVAILABLE – NOT SHOWN</b>				
	098853-11	098853-12	Tradename Decal	1
	104126-03	104126-05	Information Decal	1
	106179-01	106179-01	Owner's Manual	1
	106185-01	106185-01	Indicator Decal	1
<b>ACCESSORIES</b>				
	LPA3110		Regulator and Hose Assembly	

# WARRANTY AND REPAIR SERVICE

## KEEP THIS WARRANTY

### LIMITED WARRANTY

DESA International warrants this product and any parts thereof, to be free from defects in materials and workmanship for one (1) year from the date of first purchase when operated and maintained in accordance with instructions. This warranty is extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA International assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

This warranty does not cover discoloration due to operation of heater. We reserve the right to amend these specifications at any time without notice. The only warranty applicable is our standard written warranty. We make no other warranty, expressed or implied.

### WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA International will repair or replace the heater without charge.

### REPAIR SERVICE

Return your heater to your nearest authorized service center. Repairs not covered by the warranty will be billed at standard prices. Each Service Center is independently owned and operated. We reserve the right to amend these specifications at any time without notice.

For information, write: DESA International, P.O. Box 90004  
Bowling Green, Kentucky 42102-9004  
ATTN: Customer Service Department

When writing, always include model number and serial number.

Model \_\_\_\_\_

Serial No. \_\_\_\_\_

Date of Purchase \_\_\_\_\_

# DESA

INTERNATIONAL

2701 Industrial Drive  
P.O. Box 90004  
Bowling Green, KY 42102-9004  
[www.desatech.com](http://www.desatech.com)



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